

ANTELOPE VALLEY AIR QUALITY MANAGEMENT DISTRICT

**RULE 1110.2 -- EMISSIONS FROM STATIONARY, NON-ROAD & PORTABLE  
INTERNAL COMBUSTION ENGINES**

*(Adopted: 08/03/90; Amended: 09/07/90; Amended: 08/12/94; Amended: 12/09/94; Amended: 5/15/01)*

**(A) General**

**(1) Purpose**

- (a) To reduce emissions of Oxides of Nitrogen (NO<sub>x</sub>), Volatile Organic Compounds (VOCs) and Carbon Monoxide (CO) from Stationary or Portable Internal Combustion Engines.

**(2) Applicability:**

- (a) All Stationary ICEs over 50 bhp and all portable engines over 100 bhp-are subject to this rule.

**(B) Definitions**

- (1) “Air Pollution Control Officer (APCO)” – The person appointed to the position of Air Pollution Control Officer of the District pursuant to the provisions of California Health & Safety Code §40750, and his or her designee.
- (2) “Emergency Engine” – Any engine which operates as a temporary replacement for primary mechanical or electrical power during periods of fuel or energy shortage or while the primary power supply is under repair. Emergency Engines operate less than 200 hours per calendar year as evidenced by an installed and operating engine-hour meter and log of operating hours per Subsections (F) and (G) of this rule.
- (3) “Exempt Compounds” – Compounds listed in 40 CFR 51.100(s)(1).
- (4) “Facility” – Any building, structure, emissions unit(s) or installation which emits or may emit a Regulated Air Pollutant and which is:
  - (a) Located on one or more contiguous or adjacent properties within the District; and
  - (b) Under the control of the same person (or by persons under common control); and

- (c) Belong to the same industrial grouping, as determined by being within the same two-digit Standard Industrial Classification Code (SICC).
  - (d) For the purpose of this regulation, such above-described grouping, remotely located but connected only by land carrying a pipeline, shall not be considered one Facility.
- (5) “Internal Combustion Engine (ICE)” – Any spark- or compression-ignited internal combustion engine, not including ICEs used for self-propulsion.
- (6) “Location” – Any single site at a building, structure, facility, or installation. For engines that perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.
- (7) “Non-road Internal Combustion Engine (Non-road ICE)” – Any ICE defined under 40 CFR Part 89, which meets the specified emissions limits therein, and that does not remain or will not remain at a location for more than twelve (12) consecutive months or a shorter period of time where such period is representative of normal annual source operation at a stationary source that resides at a fixed location or more than twelve (12) months (e.g., seasonal source or operation such as canning facilities, ski resort snow making equipment) and meets any one of the following:
- (a) Is used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function such as an off highway mobile crane); or
  - (b) Is used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawn mowers and string trimmers); or
  - (c) By itself, or in or on a piece of equipment, is portable or transportable. Portable means designed to be and capable of being carried or moved from one location to another. Transportable includes, but is not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting.
- (8) “Portable Internal Combustion Engine (Portable ICE)” – Any ICE designed and capable of being carried or moved from one location to another. Indicia of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.. For the purposes of this rule, dredge ICEs on a boat or barge are considered portable ICE. The ICE is not portable if any of the following are true:
- (a) Is attached to a foundation at a single location; or
  - (b) Remains or will remain at a single location for more than 12 consecutive months; or

- (c) Is a replacement ICE for a specific application which remains or is intended to remain for twelve (12) consecutive months; or
  - (d) Is a seasonal or other source that normally operates less than twelve (12) consecutive months as its normal operational year. .
  - (e) Any period during which the ICE is not operated and is maintained at a designated storage facility shall be excluded from the residency time determination.
- (9) “Rated Brake Horsepower (bhp)” – The rating specified by the manufacturer, without regard to any derating, and listed on the ICE’s nameplate.
  - (10) “Reactive Organic Compound (ROC)” – Any compound containing carbon, which participates in atmospheric photochemical reactions, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate and those compounds listed in 17 California Code of Regulations §94508(a)(90)(1-2).
  - (11) “Regulated Air Pollutant” – Any of the following Air Pollutants:
    - (a) Any Air Pollutant, and its Precursors, for which an Ambient Air Quality Standard has been promulgated.
    - (b) Any Air Pollutant that is subject to a standard under 42 U.S.C. §7411, Standards of Performance for New Stationary Sources (Federal Clean Air Act §111) or the regulations promulgated thereunder.
    - (c) Any substance which has been designated a Class I or Class II substance under 42 U.S.C. §7671a (Federal Clean Air Act §602) or the regulations promulgated thereunder.
    - (d) Any Air Pollutant subject to a standard or other requirement established pursuant to 42 U.S.C. §7412, Hazardous Air Pollutants (Federal Clean Air Act §112) or the regulations promulgated thereunder.
  - (12) “Stationary Internal Combustion Engine (Stationary ICE)” – Any ICE which is not a Portable ICE or any ICE registered in the State-wide Portable Equipment Program.
  - (13) “Volatile Organic Compound (VOC)” – Any volatile compound containing the element carbon which participates in atmospheric photochemical reactions, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate and those compounds listed in 40 CFR 51.100(s)(1).

(C) Requirements

- (1) The owner or operator of any Stationary ICE subject to this rule shall:
- (a) Replace any such ICE with an electric motor; or
  - (b) Remove the ICE from service, permanently; or
  - (c) Reduce emissions from such ICE to the following compliance limits of TABLE I in accordance with the compliance schedule of section (D).

<b>Table I</b>		
<b>COMPLIANCE EMISSIONS LIMITS</b>		
<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
36 ppm*	250 ppm*	2000 ppm*

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15-minute interval.

- (d) Notwithstanding the provisions of subparagraph (C)(1)(c) above:
- 1. The owner or operator of any of the following:
    - a. An electric-power-generating engine,
    - b. A landfill-gas- or sewage-digester-gas-fueled engine,
    - c. An engine used to drive a water supply or conveyance pump except for aeration facilities,
    - d. An oil field-produced-gas-fired engine,
    - e. An integral engine-compressor application operating less than 4000 hours per calendar year, or
    - f. A liquefied petroleum gas (LPG)-fueled engine
  - 2. May, in lieu of conversion to-electrical power,
    - a. Reduce the emissions of carbon monoxide (CO) to no more than 2000 PPM by volume corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes, and
    - b. Reduce the emissions of oxides of nitrogen (NO<sub>x</sub>), and VOC (measured as methane from such engines) to the following engine-efficiency related compliance limits:

$$\text{Compliance Limit} = \text{Reference Limit} \times \frac{\text{EFF}}{25\%}$$

Where:

Compliance Limit = allowable NO<sub>x</sub>, or VOC emissions (ppm by volume)

Reference Limit\* = the NO<sub>x</sub> or VOC emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis, and averaged over 15 consecutive minutes.

\* These limits for various bhp ratings (continuous rating by the manufacturer) are as follows in TABLE II:

<b>TABLE II</b>		
<b>REFERENCE EMISSIONS LIMITS</b>		
<b>Bhp Rating</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>
500 bhp and greater	36 ppm*	250 ppm*
50 to 500 bhp	45 ppm*	250 ppm*

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15 minute interval.

And,

$$\text{EFF} = \frac{3413 \times 100\%}{\text{Actual Heat Rate at HHV of Fuel (Btu/kW-hr)}}$$

or

$$\text{EFF} = (\text{Manufacturer's Rated Efficiency at LHV}) \times \frac{\text{LHV}}{\text{HHV}}$$

EFF = the demonstrated percent efficiency at full load when averaged over 15 consecutive minutes of the ICE only, as calculated, within 30 days of the first source test, without consideration of any downstream energy recovery from the actual heat rate, (Btu/kW-hr) or 1.34 (Btu/hp-hr); corrected to the HHV (higher heating value) of the fuel as measured at peak load for that facility; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the ICE after correction from LHV (lower heating value) to the HHV of the fuel, whichever efficiency is higher. The value of EFF shall not be less than 25 percent. ICEs having lower efficiencies will be assigned a 25-percent efficiency for this calculation.

- (2) The owner or operator of any Portable ICE subject to this rule shall:
- (a) Register the ICE with the CARB State-wide Portable Equipment Program, successfully obtaining a valid certificate for the ICE; or
  - (b) For spark-ignited ICEs comply with the following emissions limits in TABLE III below:

<b>TABLE III</b>		
<b>SPARK-IGNITION PORTABLE ICEs COMPLIANCE LIMITS</b>		
<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>CO</b>
80 ppm*	240 ppm*	176 ppm*

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15 minute interval.

- (c) For compression-ignited ICEs comply with the following emissions limits in TABLE IV below.

<b>TABLE IV</b>	
<b>PORTABLE COMPRESSION-IGNITED ICE LIMITS</b>	
<b>Rated Brake Horsepower</b>	<b>Requirements</b>
100 bhp $\geq$ X < 117 bhp	770 ppm* NO <sub>x</sub> or a turbocharger and 4-degree injection timing retard
117 bhp $\geq$ X < 400 bhp	550 ppm* NO <sub>x</sub> or a turbocharger and aftercooler/intercooler and 4-degree injection timing retard
X > 400 bhp	535 ppm* NO <sub>x</sub> or a turbocharger and aftercooler/intercooler and 4-degree injection timing retard

\* Corrected to 15% oxygen on a dry gas basis and averaged over a 15 minute interval.

#### (D) Compliance Schedule

The owner or operator of any engine(s) shall comply with the requirements of paragraph (C) of this rule in accordance with the following schedule:

- (1) For existing ICEs, the emissions limits of (C)(2) continue to apply.
- (2) For Portable ICEs to be operated under emission compliance limits of Subparagraph (C)(2), by December 31, 2009, shall have stack modifications, including applicable stack monitoring systems, in compliance, in accordance with this rule.

- (3) Any new ICE that is not an existing ICE must be in compliance with the provisions of this and other applicable rules before being placed in service.

## (E) Monitoring

The owner/operator of any ICE subject to the provisions of paragraph (C) of this rule shall meet the following requirements:

### (1) CEMS Requirement

- (a) For stationary ICEs of 1000 bhp and greater, and operating more than two million bhp-hr per calendar year.
  - (i) The facility shall install, operate and maintain in calibration a NO<sub>x</sub> continuous emission monitoring system (CEMS) as approved by the APCO to demonstrate compliance within the emission limits of this rule.
  - (ii) Measurement and Recording – This system shall include equipment that measures and records exhaust gas NO<sub>x</sub> concentrations, corrected to 15 percent oxygen on a dry basis.
  - (iii) CEMS System Requirements – CEMS shall meet the requirements described in 40 CFR Part 60, particularly those in Appendix B, Spec. 2 and Appendix F.
  - (iv) CEMS Reporting Requirements - CEMS reporting shall be as prescribed in 40 CFR Part 60.7(c), 60.7(d) and 60.13, with NO<sub>x</sub> reported after corrections to 15 percent oxygen on a dry basis.

### (2) Alternative Monitoring Device or Equipment, in lieu of CEMS

- (a) The owner/operator of an ICE that is required to install CEMS may request in writing to the APCO approval of an alternative monitoring device (or system components) to demonstrate compliance with the limits of this rule.
  - (i) The applicant shall demonstrate to the APCO that the proposed monitoring device is, at a minimum, comparable in relative accuracy, precision, reliability and timeliness to a CEMS for that ICE, on a case-by-case basis; or
  - (ii) The APCO may approve, on a case-by-case basis, criteria for equipment which is equivalent to the criteria specified in 40 CFR 75, Subpart E.

- (iii) Such alternative monitoring device, equipment or procedure must be approved in writing by the APCO and obtain a valid permit to operate with the District. The approval shall include a monitoring plan that includes, at a minimum, equipment specifications, monitoring, record keeping, compliance testing and reporting requirements.
- (3) Data Gathering/Retrieval Capability – Any monitoring system shall have data gathering and retrieval capability approved by the APCO. Data shall be maintained for at least two years and made available for inspection by the APCO or his designee.

#### (F) Equipment and Compliance Testing Requirements

- (1) All ICEs subject to this rule shall:
  - (a) Elapsed Time Meter – All ICEs subject to this rule shall have operational non-resettable totalizing time (in hours) meters to determine the ICE's elapsed operating time.
  - (b) Compliance Testing – Provide source test information regarding the exhaust gas; specifically for NO<sub>x</sub>, VOC reported as methane, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) according to the following schedule:
    - (i) For ICE rated greater than 450 bhp – compliance testing at least every twenty-four (24) months;
    - (ii) For ICE rated at 50 to 450 bhp – compliance testing at least every thirty-six (36) months;
    - (iii) Compliance testing shall be conducted under conditions that are typical of normal engine load and duty cycle
    - (iv) The compliance test shall be conducted and the report received at the District not less than 90 days prior to the ICE's permit renewal date

#### (G) Record Keeping and Reporting

- (1) Record Keeping – The owner/operator of any ICE shall maintain an engine operating log that includes, on a monthly basis:



- (a) The total hours of operation for each day of operation; and
  - (b) Type and quantity of fuel used (liquid/gas); and
  - (c) The cumulative hours of operation since the last source test required in subparagraph (F)(2); and
  - (d) The purpose or reason for operating the engine for each day of operation.
- (2) Reporting – Required records and data shall be available for inspection any time, remain at the facility for 2 years, and upon request, be submitted to the APCO at the end of each calendar year in a manner and form approved by the APCO.

#### (H) Compliance Test Methods

- (1) NO<sub>x</sub> emissions subject to the provisions of this rule shall be determined by the procedure detailed in EPA Test Method 7E.
- (2) CO emissions by EPA Test Method 10.
- (3) VOC emissions by EPA Test Method 25, 25A or 25B.
- (4) Other test methods determined to be equivalent after review by the staffs of the District, California Air Resources Board, and the United States Environmental Protection Agency, and approved in writing by the Air Pollution Control Officer, may also be used to determine compliance with provisions of this rule.

#### (I) Exemptions

- (1) The provisions of paragraphs (C), (D), (E), (F), (G) and (H) shall not apply to:
  - (a) ICEs used directly and exclusively by the owner/operator for agricultural operations necessary for the growing of crops or raising of fowl or animals.
  - (b) ICEs operated for purposes of performance verification and testing.
  - (c) Auxiliary ICEs used to power other ICEs or gas turbines during start-ups.
  - (d) Portable ICEs that are registered under the California State-wide Portable Equipment Registration Program pursuant to Health & Safety Code §§ 41750 through 41755.

- (2) The provisions of paragraphs (C), (D), (E), (F)(1)(b), and (H) shall not apply to:
- (a) The operation of any ICE during the existence of any officially declared disaster or state of emergency.
  - (b) Emergency ICEs which operate less than 200 hours per year as determined by an elapsed operating time meter.
  - (c) Non-road engines.
  - (e) Laboratory ICEs used in research and testing purposes.
  - (f) Supplemental ICEs which operate for the manufacture of snow and/or operation of ski lifts, during seasonal operations (November 1 through April 15).

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